Claims

[c1] 1. An anti-friction and anti-wear liquid coating composition for use with parts made of materials that have softening points below about 300 ° F, the coating composition comprising:
a mixture of (i) solid lubricants comprising boron nitride, graphite and molybdenum disulfide, (ii) a thermoset resin system, (iii) at lease one catalyst for curing the resin system and (iv) a solvent system comprising highly volatile solvents.

[c2] 2. The coating composition of claim 1 wherein the solid lubricants comprise about 12-35 weight percent of the total weight of the coating composition and the solvent system comprises about 35-75 weight percent of the total weight of the coating composition.

[c3] 3. The coating composition of claim 2 wherein the solvent system has a boiling point below about 150 ° F.

[c4] 4. The coating composition of claim 3 wherein the solvent system consists of solvents selected from the group consisting of methyl ethyl ketone, 2-propoxy ethanol, xylene and diacetone alcohol.

[c5] 5. The coating composition of claim 4 wherein the resin comprises an epoxy resin.

[c6] 6. The coating composition of claim 1 wherein the coating composition comprises (in weight % of the composition) about 5-14% graphite, about 6-17% MoS_2, and about 2-5% BN, an epoxy resin in an amount of 16-25%, a vinyl butyral resin, present in an amount of about 0.1-0.4%, a tertiary amine catalyst present in an amount of about 0.1-0.5%, a dicyandimide cross-linking agent present in an amount of about 1-3%, diacetone alcohol present in an amount of about 4-12%, methyl ethylene ketone present in an amount of about 10-30%, 2-propoxy ethanol present in an amount of about 8-20%, and xylene present in an amount of about 6-18%.

[c7] 7. The coating composition of claim 1 wherein the coating composition has a viscosity of between about 5 to 75 centipoise at 25 ° C and comprises (in weight

% of the composition) about 8.1% graphite, about 10.1% MoS_2, about 3% BN, about 22.25% epoxy resin, about 0.15% vinyl butyral resin, about 0.3% tertiary amine catalyst, about 1.3% dicyandiamide cross-linking agent, about 8.3% diacetone alcohol, about 20.4% methyl ethylene ketone, about 14.5% 2-propoxy ethanol, and about 11.6% xylene.

[c8] 8. A method of coating parts made from of low softening point materials, the method comprising:
coating at least a portion of the part with an anti-friction and anti-wear hard coating composition that comprises a mixture of (i) solid lubricants comprising boron nitride, graphite and molybdenum disulfide, (ii) a thermoset resin system, (iii) at least one catalyst for curing the resin system, and a (iv) solvent system comprising highly volatile solvents; and
curing the coating composition to form a coating on the part.

[c9] 9. The method of claim 8 wherein the solid lubricants comprise about 12-35 weight percent of the total weight of the coating composition and the solvent system comprises about 35-75 weight percent of the total weight of the coating composition.

[c10] 10. The method of claim 9 wherein the solvent system has a boiling point below about 150 ° F.

[c11] 11. The method of claim 10 wherein the solvent system consists of solvents selected from the group consisting of methyl ethyl ketone, 2-propoxy ethanol, xylene and diacetone alcohol.

[c12] 12. The method of claim 11 wherein the resin comprises an epoxy resin.

[c13] 13. The method of claim 8 wherein the coating composition comprises (in weight % of the composition) about 5-14% graphite, about 6-17% MoS_2, and about 2-5% BN, an epoxy resin in an amount of 16-25%, a vinyl butyral resin, present in an amount of about 0.1-0.4%, a tertiary amine catalyst present in an amount of about 0.1-0.5%, a dicyandimide cross-linking agent present in an amount of about 1-3%, diacetone alcohol present in an amount of about 4-12%, methyl ethylene ketone present in an amount of about 10-30%, 2-propoxy

ethanol present in an amount of about 8-20%, and xylene present in an amount of about 6-18%.

[c14] 14. The method of claim 8 wherein the coating composition comprises (in weight % of the composition) about 8.1% graphite, about 10.1% MoS_2, about 3% BN, about 22.25% epoxy resin, about 0.15% vinyl butyral resin, about 0.3% tertiary amine catalyst, about 1.3% dicyandiamide cross-linking agent, about 8.3% diacetone alcohol, about 20.4% methyl ethylene ketone, about 14.5% 2-propoxy ethanol, and about 11.6% xylene.

[c15] 15. The method of claim 14 wherein the part has a softening point below about 300 ° F.

[c16] 16. The method of claim 15 wherein the part comprises HDPE.

[c17] 17. An article coated with the coating composition of claim 1 wherein the article is made of a material that has a softening point below about 300 ° F.

[c18] 18. The article of claim 17 wherein the material is made of a substantial amount of HDPE.

[c19] 19. The article of claim 17 wherein the article is made of a substantial amount of elastomer.

[c20] 20. The article of claim 17 wherein the highly volatile solvents have an evaporation/boiling point below about 150 ° F.